



September 21, 2018. Linux BSP for Renesas R-Car V3M/V3H, Release 3.0 Base

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Linux BSP for Renesas R-Car V3M/V3H, Release 3.0 Base Release Notes

1. Introduction

This report contains information about Linux BSP for Renesas R-Car V3M/V3H package including install and usage instructions and restrictions of the current release.

2. Contacts

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3. Revision History

Date	Rev	Description of Changes	By	Affiliation
September 21 2018	1.0	Initial version	Roman Meshkevich	Cogent Embedded
October 17 2018	1.1	Update test information, change log, versioning	Andrey Dolnikov	Cogent Embedded

4. Terminology / Glossary

Term	Definition
HDMI	High-Definition Multimedia Interface
USB	Universal Serial Bus
NFS	Network File System
LCD	Liquid-crystal display

5. Change History

5.1 Revision 3.0 Base

1. Fixed cropping issue in test application that shows camera sensor image (**utest-cam-imr-drm**).
2. Changed CMA assignment. CMA memory can be changed in runtime by modifying Linux kernel parameters.
3. QoS was enabled on V3H. By default V3H uses QoS version 20180901.
4. Fixed ca-certification yocto recipe.
5. Added option to capture and save camera sensor images in **utest-cam-imr-drm** test application.
6. QSPI driver: fixed issues related to non-block aligned access (used in JFFS2), DMA support for read operations.
7. Added support camera sensors: AR0143, AR0233, 0x3A, GM4200, IMX390.

6. Package structure

Linux BSP for Renesas R-Car V3M/V3H package is :

- *yocto_src*: Snapshot of all Yocto layers required to build BSP from the scratch.
- *scripts*: contains script files that allow to build current release.
- *sdk*: contains Linux and Windows SDK for application development.
 - poky-glibc-x86_64-core-image-minimal-aarch64-toolchain-2.1.3.sh – self-extracting Linux SDK
 - poky-glibc-x86_64-core-image-minimal-aarch64-toolchain-2.1.3.zip – Windows SDK
- *boards*: contains an archive that includes 4 directories for Condor, Eagle, V3M Starter Kit and V3H Starter Kit. Each with:
 - Linux kernel and corresponding device tree files:
 - “Image-<revision-id>-<board name>-<build time>.bin”
 - “Image-<revision-id>-<board name + extension name if applicable>-<build time>.dtb”
 - Root filesystem tarball named
 - “core-image-minimal-<board name>-<buildtime>.rootfs.tar.bz2”

Note that Linux kernel image and corresponding device tree files are also located under ‘/boot’ directory.

This document is included into rootfs under ‘root’ directory.
- Manifest file named “core-image-minimal-<board name>-<buildtime>.rootfs.manifest”
- Firmware images including u-boot, cr7 loader, ARM Trusted Firmware, CA53 Loader, Loader (boot parameters, certification).

7. Tested elements and known issues

7.1 Tested elements

Tested item	Result
HDMI + display unit	OK
PCI-E + NVME	PCI-E x2 performance issues
ISP (UIO driver)	OK
IMP (UIO driver) – tested with CNN block	OK
Can / Canfd	OK
CPU	CPU 0 can not be set offline
Ethernet	V3H Ethernet performance less then 1GB/s
IMR v4l2 driver	OK
IMR uio driver	OK
Qspi	OK
PMIC	OK
Uboot	OK
Rootfs complexity	OK
Linux loading	OK
Kernel modules load/unload	OK

7.2 Camera sensor support

This table contains summary of all supported cameras

Board	Extention board	Extention function	Kernel dtb	Camera type	Max supported cameras	Tested	Notes
eagle	n/a	-	Image-r8a7797-eagle.dtb	imi21 / imi20	4	+	
condor	n/a	-	Image-r8a7798-condor.dtb	imi21 / imi20	4	+	
v3hsk	vbm v2 gmsl	-	Image-r8a7798-vbm-v2.dtb	imi21 / imi20	4	+	Power 9V
v3hsk	vb 4ch	-	Image-r8a7798-vb-4ch.dtb	Imi23 / imi24	4	+	Power 11V
v3hsk	vb 8ch	-	Image-r8a7798-vb-8ch.dtb	Imi23 / imi24	8	+	Power 11V
v3hsk	vbm v3 fpdlink	-	Image-r8a7798-vbm-v3.dtb	Imi23 / imi24	4	+	Power 11V
v3msk	vbm v2 gmsl	-	Image-r8a7797-vbm-v2.dtb	imi21 / imi20	4	+	Power 9V
v3msk	vbm v3 fpdlink	-	Image-r8a7797-vbm-v3.dtb	imi24	4	+	power 11 V 4 cameras simultaneously can cause artifacts due to lack of bandwidth
v3msk	vbm v3 fpdlink	-	Image-r8a7797-vbm-v3.dtb	imi23	4	+	power 11 V

7.3 Known issues

1. PCI-E + NVME – Write performance is about 370MB/s. Such value is closer to PCI-E x1 than PCI-E x2
2. Move offline issue – moving core 0 to offline state produce kernel error.
3. V3H Ethernet performance – TCP stream receiving rate is about 700MBit/s